The science behind the report:

Dell EMC CloudIQ streamlined the user experience in five cloud-based storage preventive management tasks

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Dell EMC CloudIQ streamlined the user experience in five cloud-based preventive storage management tasks.

We concluded our hands-on testing on April 13, 2020.

Our results

Table 1: The results from our testing.

	Dell EMC™ CloudIQ	HPE InfoSight with Primera	3PAR StoreServ Management Console (SSMC)*
Use case 1: Assessing capacity approaching full			
Time (seconds)	1.00**	11.25	N/A
Steps	1	5	N/A
Use case 2: Investigating a host that is no longer highly available			
Time (seconds)	1.00**	17.20	N/A
Steps	1	2	N/A
Use case 3: Assessing performance impact and anomaly detection			
Time (seconds)	19.87	N/A	43.69
Steps	3	N/A	6
Use case 4: Identifying "noisy neighbor" VMs and workloads			
Time (seconds)	26.50 for VM detection 17.95 for LUN detection	N/A	43.69
Steps	4 for VM detection 2 for LUN detection	N/A	6
Use case 5: Identifying reclaimable storage opportunities			
Time (seconds)	1.00**	N/A	43.69
Steps	1	N/A	6

*HPE SSMC results are based on a "best approximation" workflow, i.e., the number of steps required to view performance data across all LUNs and VMs.

**CloudIQ provided this information on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our administrator getting oriented and locating the information.

Table 2: The savings the Dell EMC solution provides (time in seconds).

	Dell EMC Unity XT	HPE Primera 650	Dell EMC win percentage less time	Dell EMC win times faster
Use case 1: Assessing capacity approaching full	1.00**	11.25	91.1%	10.25
Use case 2: Investigating a host that is no longer highly available	1.00**	17.20	94.2%	16.20
Use case 3: Assessing performance impact and anomaly detection	19.87	43.69	54.5%	1.20
Use case 4: Identifying "noisy neighbor" VM	26.50	43.69	39.3%	0.65
Use case 4: Identifying "noisy neighbor" LUN	17.95	43.69	58.9%	1.43
Use case 5: Identifying reclaimable storage opportunities	1.00**	43.69	97.7%	42.69

Table 3: The savings the Dell EMC solution provides (steps).

	Dell EMC Unity XT	HPE Primera 650	Dell EMC win percentage fewer steps
Use case 1: Assessing capacity approaching full	1	5	80.0%
Use case 2: Investigating a host that is no longer highly available	1	2	50.0%
Use case 3: Assessing performance impact and anomaly detection	3	6	50.0%
Use case 4: Identifying "noisy neighbor" VM	4	6	33.3%
Use case 4: Identifying "noisy neighbor" LUN	2	6	66.7%
Use case 5: Identifying reclaimable storage opportunities	1	6	83.3%

*HPE SSMC results are based on a "best approximation" workflow, i.e., the number of steps required to view performance data across all LUNs and VMs.

**CloudIQ provided this information on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our administrator getting oriented and locating the information.

System configuration information

We completed our testing on storage solutions hosted remotely in the Dell EMC lab. Both solutions had a comparable number of servers, storage processors, and disk shelves.

Table 4: Remote solution configuration information.

Solution configuration information	Dell EMC Unity XT	HPE Primera 650
Number and type of disks	24x SSD	24x SSD
Number of storage processors	2	2
Load generation hosts	2x Dell EMC PowerEdge™ R740	2x Dell EMC PowerEdge R740

How we tested

Dell EMC provided a VMware environment hosted on the rack servers for each storage solution. Using HCIBench and Vdbench, we created three workload profiles to simulate typical business activity:

- Steadily increasing storage writes over a 24-hour period to simulate logs, new customers and orders, and other cumulative data
- Bursts of mixed I/O at the end of each day to simulate close-of-business sync operations
- High demand mixed I/O at random times to simulate unexpected traffic and an increase in storage activity

We used the workloads above to test the Capacity Approaching Full and Performance Impact and Anomaly Detection features of Dell EMC CloudIQ. To test the Reclaimable Storage feature, we created one additional HCIBench VM per solution, ran a database mix for 2 hours, then disconnected the LUN from the host. Using Iometer, we also created two Microsoft Windows VMs (per solution) running heavy sequential write workloads to test the noisy neighbor identification feature. To test the non-highly available host, we disconnected a host bus adapter on one of the storage processors in each solution.

Timing and steps

In this section, we present the exact times and steps our technician needed to find each feature we tested, starting once they were logged into the storage management tool. CloudIQ, which we used on the Dell EMC Unity XT array, provided some of these features on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our technician getting oriented and locating the information. On HPE InfoSight, which we used on the Primera array, many of the features did not exist and didn't have a direct comparison at the time of testing. For those cases, we recorded the time and steps for an admin to perform the closest-match workflow on HPE InfoSight for the Primera array, which in all cases meant that we used the SSMC virtual volume performance overview.

Table 5: Detailed testing methodology and results.

Dell EMC Unity XT	HPE Primera 650
Use case 1: Assessing capacity approaching full	
1 step 1.00 second Note: CloudIQ provided this information on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our administrator getting oriented and locating the information.	5 steps 11.25 seconds 1. Click HPE Primera & 3PAR StoreServ. 2. Click Infrastructure. 3. Click Systems. 4. Click system model. 5. Click Capacity tab.
Use case 2: Investigating a host that is no longer highly available	
1 step 1.00 second Note: CloudIQ provided this information on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our administrator getting oriented and locating the information.	2 steps 17.20 seconds 1. Click HPE Primera & 3PAR StoreServ. 2. Mouse over the Wellness Score, and click Host(s) not seen by multiple controller nodes.
Use case 3: Assessing performance impact and anomaly detection	
3 steps 19.87 seconds 1. Click Performance. 2. Click System Performance. 3. Select system.	Best approximation: Use 3PAR SSMC virtual volume performance overview. 6 steps 43.69 seconds 1. Click 3PAR StoreServ→System. 2. Click Overview→Performance. 3. Select Exported Volumes. 4. Select Detail. 5. Select Top 30. 6. Click Apply.

Dell EMC Unity XT	HPE Primera 650
Use case 4: Identifying "noisy neighbor" VMs and workloads	
VM detection: 4 steps 26.50 seconds 1. Click the Performance Impact dashboard. 2. Click Details. 3. Select the noisy neighbor LUN. 4. Highlight the chart area to reveal the affected VMs. LUN detection: 2 steps 17.95 seconds 1. Click the Performance Impact dashboard. 2. Highlight the chart area to reveal the affected LUNs.	Best approximation: Use 3PAR SSMC virtual volume performance overview. 6 steps 43.69 seconds 1. Click 3PAR StoreServ➔System. 2. Click Overview➔Performance. 3. Select Exported Volumes. 4. Select Detail. 5. Select Top 30. 6. Click Apply.
Use case 5: Identifying reclaimable storage opportunities	
1 step 1.00 second Note: CloudIQ provided this information on the overview screen that appears immediately after logging in. We've used one step and 1 second to account for our administrator getting oriented and locating the information.	Best approximation: 3PAR SSMC virtual volume performance overview. 6 steps 43.69 seconds 1. Click 3PAR StoreServ➔System. 2. Click Overview➔Performance. 3. Select Exported Volumes. 4. Select Detail. 5. Select Top 30. 6. Click Apply.

Read the report at http://facts.pt/m8a5u3v ▶

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